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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,281	04/06/2001	E. Neil Lewis	S0001-014002	6341

26653 7590 10/23/2003

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EXAMINER

CURTIS, CRAIG

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/828,281

Applicant(s)

LEWIS ET AL.

Examiner

Craig H. Curtis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 01 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-170 is/are pending in the application.
- 4a) Of the above claim(s) 77-123 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-76 and 124-170 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Disposition of the Instant Application

- This Office action is responsive to Applicants' Amendment B filed on 1 August 2003 and made of record in the file as Paper No. 13.
- By this Amendment, Applicants have amended originally filed claims 1, 11, 22, 39, and 58. In addition, Applicants have newly added claims 124-170. (Claims 77-123 were withdrawn from consideration by the Examiner in the previous Office action as being directed to a non-elected species.)
- Claims 1-76 and 124-170 will be examined as to their merits.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims 1-14, 16-53, 55-76, and 125-170 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (5,377,003) in view of Richard (4,599,001).

Lewis et al. disclose (with reference to Fig. 6) the invention as claimed--an imaging optical instrument for acquiring images of a sample area, and an optical spectroscopic method, comprising:

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a spatial detector (46), including a plurality of aligned detector elements (See Fig. 6),

a variable filter (14) having wavelength response characteristics that vary in at least one direction (filter 14 is taught as being tunable), wherein there is an optical path from the variable filter to the spatial detector (See Fig. 6), wherein said variable filter is both a variable band-pass filter and a continuously variable filter, (both inherent w/r/t the functioning of AOTF 14)--EXCEPT FOR an additional teaching wherein said imaging optical instrument further comprises an actuator operatively connected between the variable filter and the spatial detector, operative to move the variable filter relative to the spatial detector along the direction in which the wavelength response characteristics vary, while maintaining at least some concurrent optical paths from the sample area to the spatial detector that pass through different portion of the variable filter having different wavelength response characteristics (the "while" qualifying phrase inherently being met by the necessarily finite aperture of said AOTF 14 taught by Lewis et al.).

Richard, however, provides an explicit teaching of an actuator (62 or 64 in Figs. 1, 2, and 4(a)-4(c)) operatively connected between a variable filter (e.g., band-pass filters 42, 44, 46, 48, 50, and 52 in filter trays 38 and 40) and operative to move said variable filter (by separately moving one or more of collectively disposed filters 42, 44, 46, 48, 50, and 52) relative to said spatial detector along the direction in which said filter characteristics vary (inherent). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified, without sacrificing desired performance characteristics, the imaging optical instrument for acquiring images of a sample area of Lewis et al. such that the relatively complicated and costly variable filter taught therein be replaced by the comparatively simple and inexpensive variable filter and actuator taught by Richard, for at least the purpose of significantly reducing both the cost

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of manufacture and the complexity of operation of said imaging optical instrument for acquiring images of a sample area.

Lewis et al. further teach (See Abstract) wherein said spatial (alt. two-dimensional) detector (46) operates within the ultraviolet, visible, near-infrared (aka infrared) regions of the electromagnetic spectrum (sources of such light being, if not explicitly disclosed by Lewis et al., exceedingly well known in the spectroscopic art, and, arguably, at least implicitly taught by the non-filtered light source (11) in Lewis et al.; moreover, the broadband source (10) in Lewis et al. certainly has the potential of exciting fluorescent emission from a sample or samples at wavelengths longer than that of the source of excitation light, such emission satisfying the claimed sources; and finally, the non-filtered light source (11) is taught as being a laser, and the use of ultraviolet, visible, and infrared (near-, intermediate-, or far-) lasers in spectroscopy is notoriously old and well-known).

The device of the combination explicitly includes the teaching a narrow-band source (light that has passed through one or more of said band-pass filters, narrow-band being a relative term) and wherein said spatial detector and said variable filter are operative on wavelengths outside of the bandwidth of said narrow-band source (explicit in the teaching by Lewis et al. wherein said spatial detector variously operates within the ultraviolet, visible, and near-infrared regions of the electromagnetic spectrum).

Lewis et al. explicitly teach wherein said apparatus of claim 1 further includes logic responsive to the spatial detector to combine a series of images from the spatial detector to obtain spectral images (col. 15, ll. 1-8); wherein logic is responsive to the spatial detector to combine data from a series of image pixels from images acquired by the spatial detector to obtain individual pixel spectra (col. 15, ll. 10-17); and further

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including, at least implicitly, the step of shifting acquired data on a line-by-line basis as it is being acquired (a routine operation in commercial image processing programs, such as the disclosed BioScan Optimas 3.0 program; it is noted that claim 11 contains a method teaching yet depends from an apparatus claim--actually, an *instrument* claim, since the word "apparatus" is never recited in claim 1).

Lewis et al. also teach wherein said instrument further includes a first stage optic (32) between said sample and said detector, said first stage optic being an image formation optic (See 32 in Fig. 6) that includes a magnifying optic (Id.).

Lewis et al. additionally teach wherein said instrument further includes logic responsive to the detector to selectively display spectral information that relates to at least one predetermined substance in the sample (inherent), as well as common logic operative to control said actuator and cause the detector to acquire an image (See Lewis et al.); further includes multivariate spectral analysis logic responsive to data acquired by said detector (implicit in commercial image processing packages, even BioScan Optimas 3.0).

Lewis et al. further teach the following: wherein said spatial detector is a two-dimensional array detector (See Fig. 6), an integrated semiconductor array detector (Id.); wherein said variable filter is between said sample area and said spatial detector (See Fig. 6); and although the combination does not explicitly teach wherein said variable filter is disposed between said source and said sample area, the placement of said variable filter (e.g., 14 in Fig. 6 of Lewis et al.) is not critical to the functioning of said instrument, and could just as easily (not to mention obviously) have been placed between 10 or 11 and 35, as opposed to being externally disposed with respect to said source and said sample area, as a design expedient in the assembly of said instrument.

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With regard to the limitation that recites wherein the spatial detector, the filter, and the actuator are all included in a same transportable instrument, it is presumed that said instrument of the combination is transportable. And even if such is not the case, providing portability or moveability without producing any new and unexpected result involves only routine skill in the art. In re Lindberg, 93 USPQ (CCPA 1952).

With regard to the limitation wherein the instrument weighs less than 150 kilograms, changes in size and weight are generally recognized as being obvious and within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

Lewis et al. explicitly teach wherein the step of combining results in one or more Raman images (See above & claim 5), and wherein the step of combining results in one or more fluorescence images (See above & claim 16).

The combination implicitly, if not explicitly, teaches a step of providing a number of discrete sub-areas in the sample are; and providing a reference substance in a sample area is a common step in the calibration of optical sampling instruments.

The provisioning of providing an array of different samples on a chip is exceedingly well-known in the art of spectroscopic measurement.

With regard to claims 32 and 71, the combination discloses the claimed invention as set forth above EXCEPT FOR an explicit teaching wherein the step of providing sub-areas defines sub-areas with an array of discrete reaction vessels. It would however, have been obvious to extend the sampling method taught by the combination to take into account (i.e., sample) an array of discrete reaction vessels, for at least the purpose of analyzing a greater number of samples in a given time, since it has been held that mere

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duplication of essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

2. Claims 15 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lewis et al. (5,377,003) in view of Richard (4,599,001), and further in view of Mark et al. (6,120,518).

The combination discloses the claimed invention as set forth above regarding claims 12 and 51 EXCEPT FOR an additional teaching wherein said first stage optic includes portions of an endoscopic probe. Mark et al., however, discloses a first stage optic that includes portions of an endoscopic probe (60 in Fig. 7). It would have been obvious to one having ordinary skill in the art at the time the invention was made to have substituted the first stage optic including portions of an endoscopic probe taught by Mark et al. for the first stage optic(s) taught by the combination, for at least the purpose of increasing the versatility of said instrument of the combination.

Response to Arguments

3. Applicants' arguments filed 1 August 2003 have been fully considered but they are not persuasive. Applicants initially argue that Lewis et al. do not disclose or suggest that their AOTF should have wavelength response characteristics that vary in one spatial direction, or that there should be concurrent optical paths from the sample area to the spatial detector that pass through different portions of the variable filter having different wavelength response characteristics. However, while the Examiner concedes these points, AOTFs such as that disclosed by Lewis et al. inherently exhibit such characteristics (by virtue of, e.g., their input aperture and method of operation). And with regard to the desirability of adding a linear actuator from the

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Richard selection device to the Lewis et al. spectroscopic device, obviousness, not desirability, is the standard by which the appropriateness of 103 rejections are judged, and as such, the Examiner respectfully contends that the substitution of dynamic elements for static elements is well-known in the optical art.

Conclusion

4. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

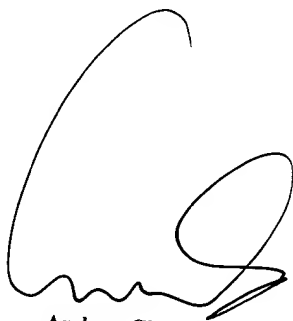
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Contact Information

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig Curtis, whose telephone number is (703) 305-0776. The centralized facsimile phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature regarding to status of this application should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read 'Audrey Chang', with a large, stylized loop at the end.

Audrey Chang
Primary Examiner
Technology Center 2800

CHC

Craig H. Curtis
Group Art Unit 2872
17 October 2003